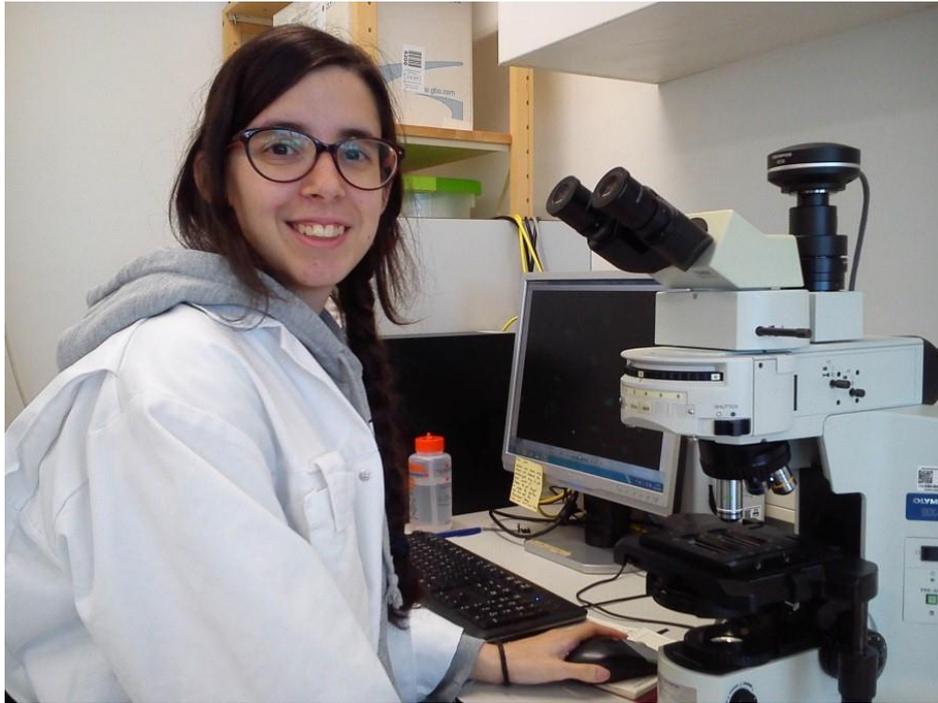




Mixed biofilms: how does *Listeria* react to the presence of other bacteria?



My name is **Natalia Crespo**. I am 24 years old, and I come from Spain. I did my undergraduate degree in Biological Sciences at the Universidad Complutense de Madrid, but I spent the last year working on my research project in Microbiology at the University of Calgary, in Canada. Last year I finished my MSc in Medical Microbiology at the London School of Hygiene & Tropical Medicine, and now I have just started my PhD at Wageningen University, in The Netherlands. The List_Maps network aims to understand how the bacterium *Listeria monocytogenes* responds to the many different environments that it encounters during its life cycle. My project will focus mainly on the **survival of *L. monocytogenes* in the food industry**: when food-processing materials get colonized by *L. monocytogenes* the raw food products pick up the bacteria as they pass through the food-processing line, which ends up in product contamination and people getting sick.

However, *L. monocytogenes* does not just randomly swim around food factories; it forms biofilms on the surface of food-processing equipment. Biofilms are sticky, mucoid structures that are produced by bacteria, and act as a thick glue that keeps the cells together and firmly attached to the surface. **Biofilms behave like shields for bacteria**: they protect the cells from disinfectant products and cleaning treatments, and are generally very hard to get rid of, which represents a great risk for food safety. Not all the bacterial cells behave the same way within the biofilm; they are organized, and they perform different functions. Moreover, biofilms in nature are not usually formed by just one species of bacteria. Biofilms are poly-microbial environments, and the presence of different species of bacteria –and even different strains of the same species-, and their interactions with each other, can play a role in the growth of the biofilm.

During my project I will study the effect of co-culturing different combinations of *L. monocytogenes* strains and secondary bacterial species in mixed biofilm ecology, using fluorescence microscopy to visualize the different cells in the biofilm. I will also try to identify the mechanisms that the cells use to communicate with each other within the biofilm, by isolating specific signaling molecules. Finally, I will use DNA and RNA-sequencing techniques to understand what makes a particular strain of *L. monocytogenes* a strong biofilm performer.

Main research objectives:

- ✓ Study the ecology and behavior of *L. monocytogenes* biofilms.
- ✓ Analyze cell-cell interactions within the biofilm, and look for strain/species competition.
- ✓ Identify genetic and/or transcriptomic biomarkers that characterize efficient biofilm performance in *L. monocytogenes*.

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